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Codes Used to Identify Psychosocial Treatment

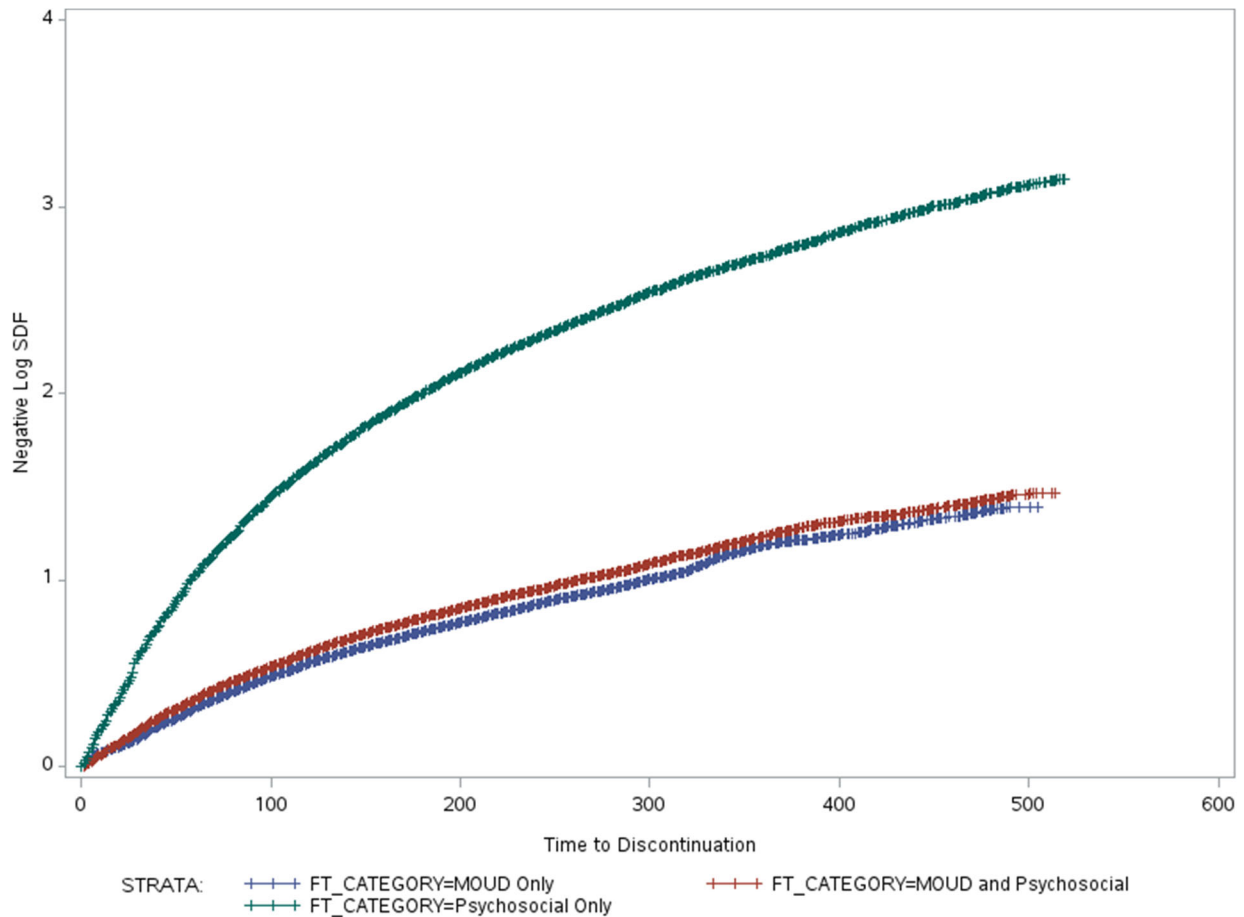| Category	Code Type	Codes
Rehab Treatment Center	Revenue	0118, 0128, 0138, 0158, 1002
Hospital inpatient therapy	HCPCS	H0017
Hospital inpatient therapy	ICD-9 Procedure	94.64, 94.66, 94.67, 94.69
Hospital inpatient therapy	ICD-10 Procedure	HZ3*, HZ4*, HZ5*, HZ6*
Non-hospital residential therapy	HCPCS	H0018 - H0019
Partial hospitalization	Revenue	0912 - 0913
Partial hospitalization	HCPCS	H0035
Intensive outpatient	HCPCS	S9480
Intensive outpatient	Revenue	0905 - 0907
Intensive outpatient	HCPCS	H0015
Outpatient	Revenue	0900, 0911, '0914 - 0916, 0919, 0944
Outpatient	HCPCS	H0001 - H0002, H0004 - H0006, H0016, H0020, H0022 - H0023, H0028, H0031 - H0032, H0036 - H0038, H0046 - H0047, H0050, H2000 - H2001, H2013, H2015 - H2022, H2027, H2032 - H2036, H5030, H5299, G0071 - G0082, G0176 - G0177, G0463, G0467, G0469 - G0470, M0064, S9454
Outpatient	CPT	90791 - 90792, 90801 - 90802, 90804 - 90819, 90821 - 90823, 90826 - 90829, 90832 – 90840, 90842 - 90849, 90853, 90855, 90857, 90862, 90865, 90875 - 90876, 90880, 97003 - 97004, 99058, 99201-99205; 99211-99215; 99241-99245, 99412

Defining Gaps in Treatment for Opioid Use Disorder

We defined gaps in pharmacotherapy as a 30+ day gap in day supply for prescription oral buprenorphine or naltrexone, 60+ day gap in medical claims for buprenorphine or naltrexone injections, and 30+ day gap in medical claims for methadone administration. For psychosocial treatment, a gap occurred when a subject did not have a subsequent medical claim for a psychosocial service within 30 days. Treatment end was set as the run out date of pharmacotherapy, the discharge date if the claim for pharmacotherapy occurred during an inpatient stay and run out occurred before the discharge date, or 29 days beyond the last claim for psychosocial treatment or beyond the discharge date of the last inpatient stay involving psychosocial treatment. The run out date for pharmacotherapy was based on day supply. Injections for buprenorphine and naltrexone were assumed to last 30 days, and methadone administrations were assumed to be in effect for the day of the claim. If a subject disenrolled from the health plan and had no gap in treatment before disenrollment, the disenrollment date marked the end of the initial treatment episode. Treatment episodes were capped at 18 months.

Evaluation of the Proportional Hazards Assumption for Treatment Selection in the Cox Proportional Hazard Model for Opioid Use Disorder Treatment Discontinuation
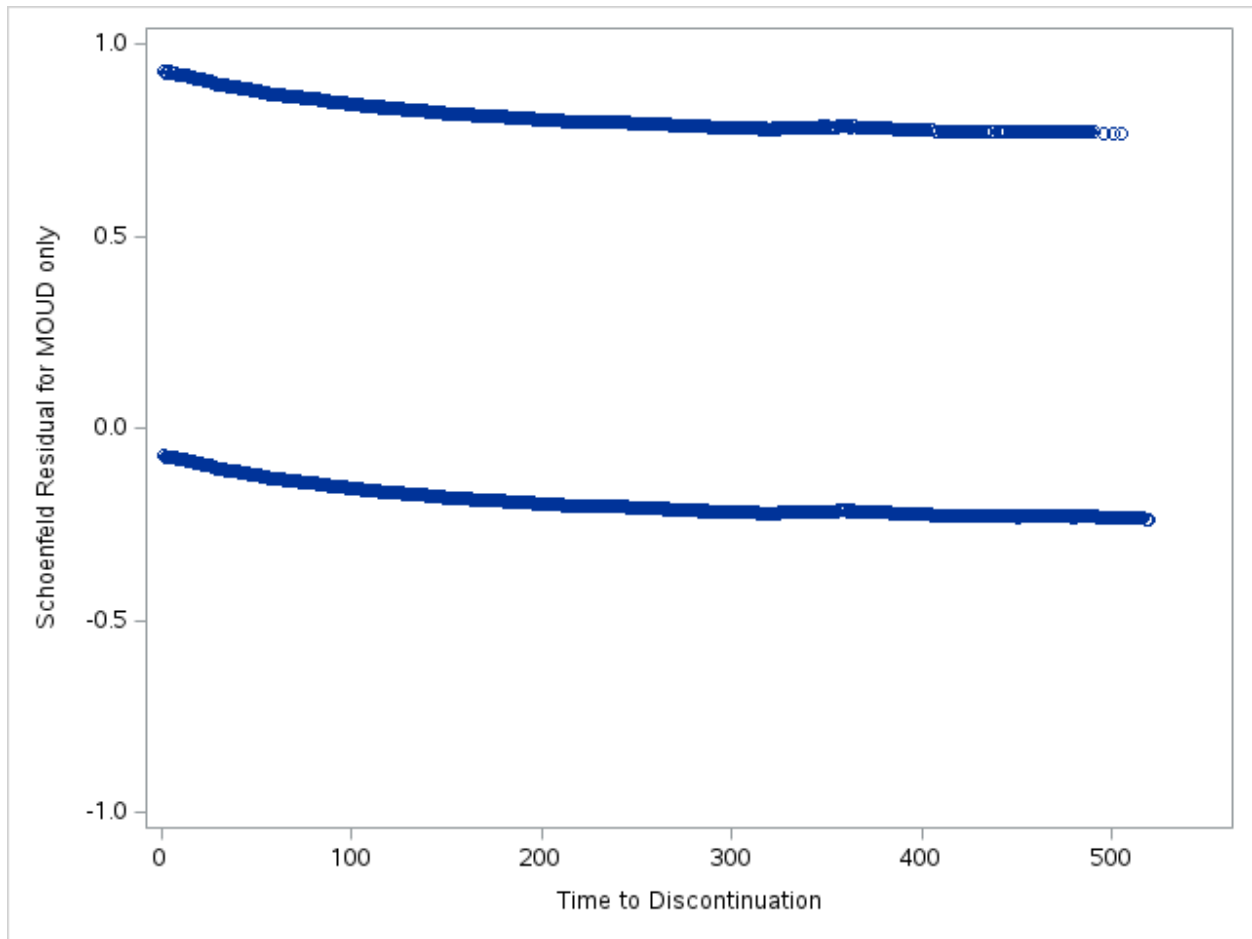
The proportionality assumption was evaluated for treatment selection visually and tested by including an interaction of treatment selection and time in the Cox model. There was some evidence of nonproportionality, but its magnitude was modest. Many models had statistically significant interaction between the covariate of interest, hazard, and time; however, the log(-log(survival)) plots were close to parallel, the Schoenfeld residuals plots were nearly flat, and the Pearson correlation coefficient between Schoenfeld residuals and log(time at risk) were nearly zero

The graph below demonstrates that the log(-log(survival)) plots were close to parallel.

STRATA: ++++ FT_CATEGORY=MOUD Only   ++++ FT_CATEGORY=MOUD and Psychosocial
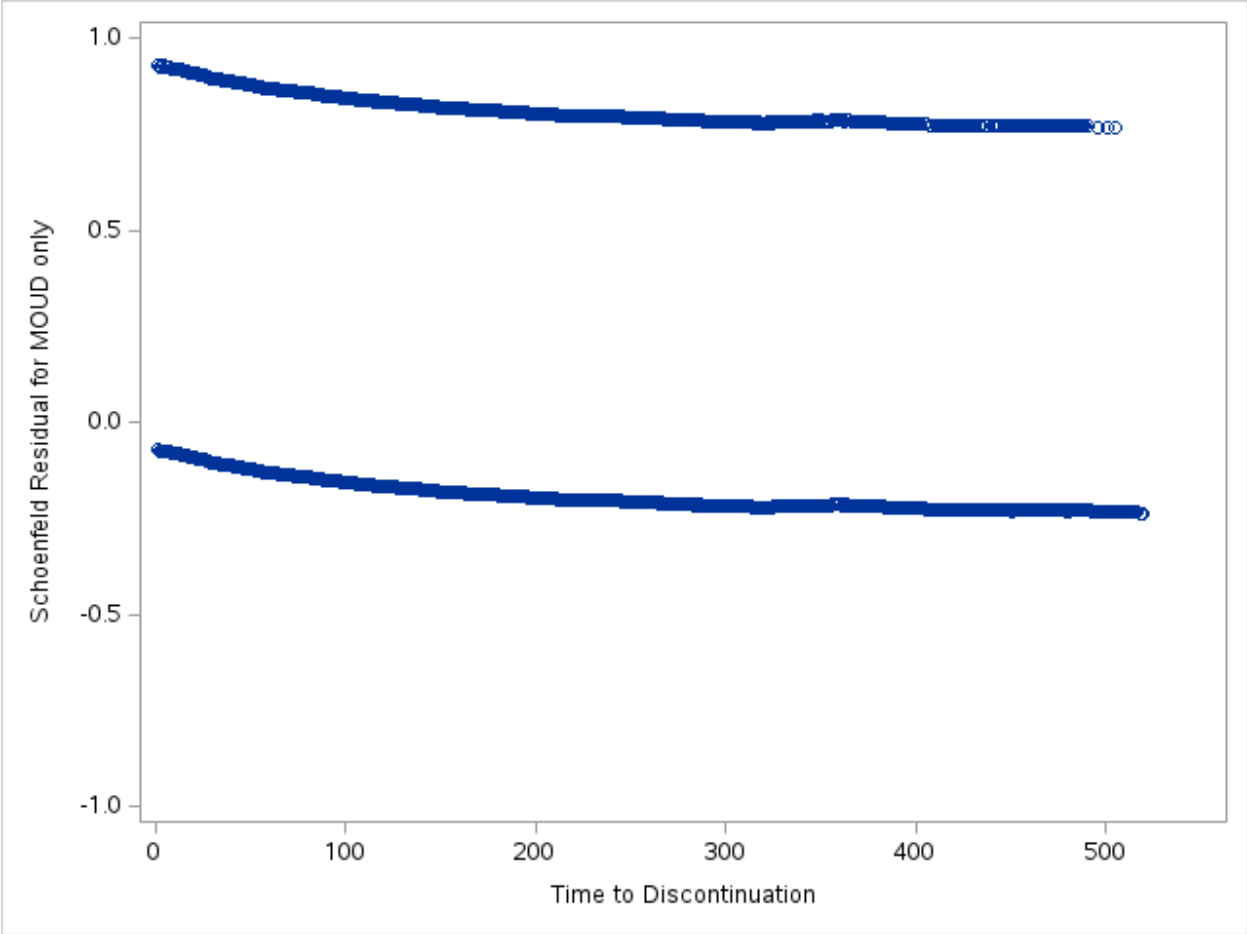   ++++ FT_CATEGORY=Psychosocial Only

MOUD = medication for opioid use disorder

The graphs below show that the Schoenfeld residuals plots were nearly flat.

MOUD = medication for opioid use disorder

MOUD = medication for opioid use disorder

The table below demonstrates that the Pearson correlation coefficient between Schoenfeld residuals and log(time at risk) were nearly zero.

Pearson Correlation Coefficients **Prob > |r| under H0: Rho=0** **Number of Observations**		
	logtime	**sqtime**
Schoenfeld Residual for MOUD Only	0.03561	0.05069
	<.0001	<.0001
	41003	41003
Schoenfeld Residual for MOUD with Psychosocial Treatment	0.04368	0.03998
	<.0001	<.0001
	41003	41003

MOUD = medication for opioid use disorder

Codes Used to Identify Infections from Possible Injection Drug Use

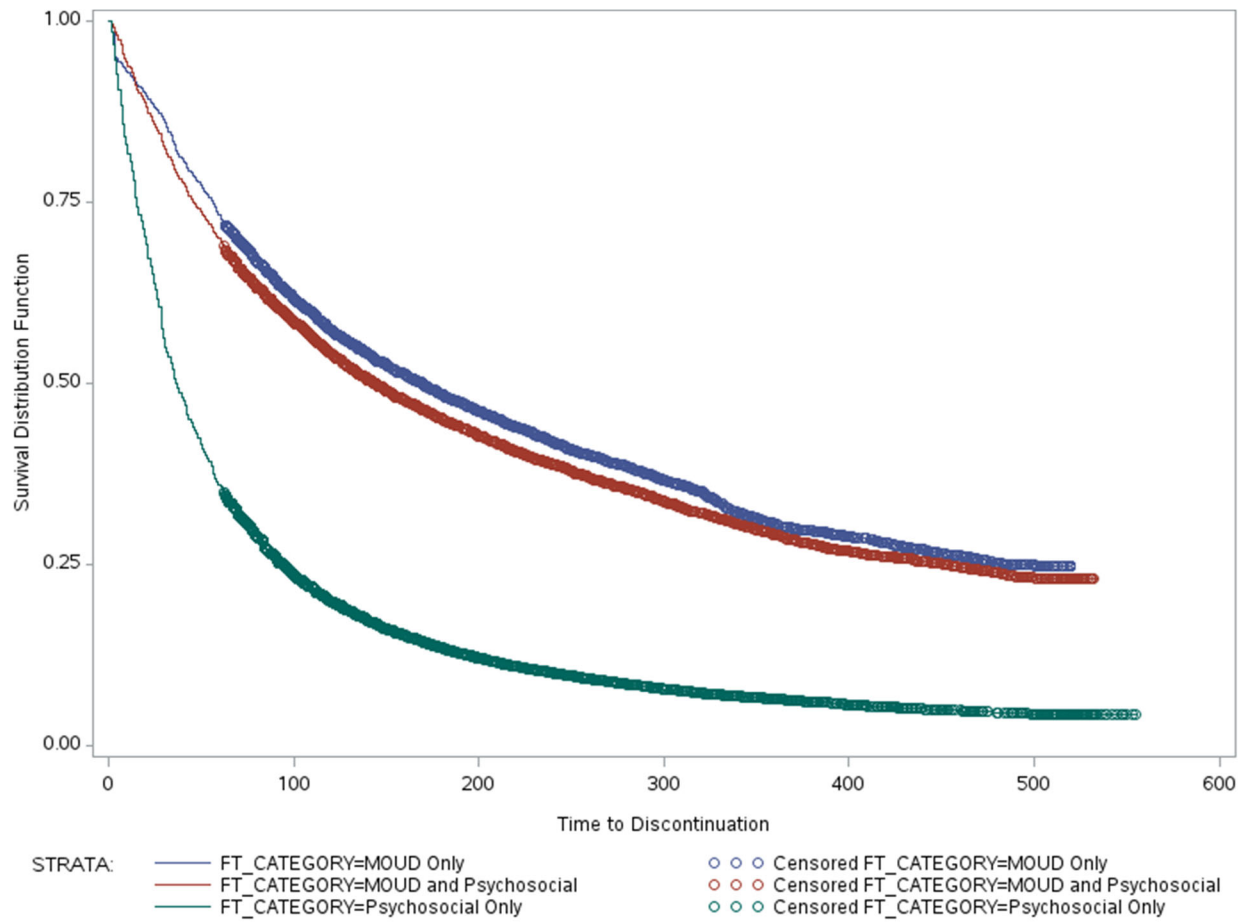| Infections	ICD-9 Codes	ICD-10 Codes
Bacterermia or Sepsis	0380, 03810, 03811, 03812, 03819, 0382, 0383, 03840,03841, 03842, 03843, 03844, 03849, 0388, 0389, 41512, 42292, 449, 78552, 7907, 99590, 99591, 99592	A409, A412, A4101, A4102, A411, A403, A414, A4150, A413, A4151, A4152, A4153, A4159, A4189, A419, I2690, I400, I76, R6521, R7881, R6510, R6520
Endocarditis	11281, 4210, 4211, 4219, 4240, 4241, 4242, 4243, 42490, 42491, 42499	B376, I330, I39, I339, I340, I348, I350, I358, I352, I351, I359, I360, I368, I370, I378, I38
Osteomyelitis	73000, 73001, 73002, 73003, 73004, 73005, 73006, 73007, 73008, 73009, 73010, 73011, 73012, 73013, 73014, 73015, 73016, 73017, 73018, 73019, 73020, 73021, 73022, 73023, 73024, 73025, 73026, 73027, 73028, 73029, 73090, 73091, 73092, 73093, 73094, 73095, 73096, 73097, 73098, 73099	M8610, M8620, M86119, M86219, M86129, M86229, M86139, M86239, M86149, M86249, M86159, M86259, M86169, M86269, M86179, M86279, M8618, M8628, M8619, M8629, M8660, M86619, M86629, M86639, M86642, M86659, M86669, M86679, M8668, M8669, M869, M4620, M4630
Skin or Soft Tissue Infections	0400, 3240, 3241, 3249, 326, 56722, 56731, 56738, 5695, 5720, 59010, 59011, 68100, 68101, 68102, 68110, 68111, 6819, 6820, 6821, 6822, 6823, 6824, 6825, 6826, 6827, 6828, 6829, 7098, 7236, 72886, 72930, 72939, 7854	A480, G060, G061, G062, G09, K651, K6812, K6819, K630, K750, N10, L03019, L03029, L03039, L03049, K122, L03211, L03212, L03213, L03221, L03222, L03319, L03329, L03119, L03129, L03317, L03811, L03818, L03891, L03898, L0390, L0391, L942, L988, M5402, M726, M793, I96

The source for the ICD-9 codes was

Tookes, H, Diaz C, Li H, et al: A cost analysis of hospitalizations for injections related to injection drug use at a county safety-net hospital in Miami, Florida. PLoS One 2015; 10: e0129360.

The General Equivalence Mappings (GEMs) was used to convert ICD-9 to ICD-10 codes.

Treatment Initiation and Initial Treatment Type by Opioid Use Disorder Diagnosis

	Statistic	Total N=204,225	Opioid Dependence N=137,706	Opioid Use N=16,629	Opioid Abuse N=17,945	Adverse Events N=15,119	Opioid Poisoning N=13,168
Treatment Start with 30 Days	N	71,571	48,000	2,953	7,912	1,308	3,589
	%	35.05	34.86	17.76	44.09	8.65	27.26
Initial Treatment Type							
Pharmacotherapy Only	N	11,378	2,316	36	176	15	45
	%	5.57	1.68	0.22	0.98	0.10	0.34
Psychosocial Only	N	50,178	37,983	2,821	6,978	1,282	3,451
	%	24.57	27.58	16.96	38.89	8.48	26.21
Both	N	10,015	7,701	96	758	11	93
	%	4.90	5.59	0.58	4.22	0.07	0.71

Kaplan-Meier Curves for Time to Treatment Discontinuation, by Initial Treatment Type

MOUD = medication for opioid use disorder